

CLAIMS

1. A data transmission method between two transceivers, comprising:

using more than one antenna for transmitting and receiving a signal
at least in one transceiver;

dividing in the first transceiver the symbols to be transmitted into blocks, the number of which is divisible by the number of transmitting antennas;

transmitting one block using each antenna;

receiving the blocks in the second transceiver using one or more antennas;

checking in the second receiver whether all blocks were received successfully;

transmitting an acknowledgement to the first transceiver;

and, if the reception of the blocks failed,

storing the blocks in memory in the second transceiver;

retransmitting the same blocks from the first transceiver in a predetermined format;

receiving the retransmitted blocks in the second transceiver using one or more antennas and combining them with the blocks in memory,

the predetermined format being selected in the method so that the blocks transmitted first and the retransmitted blocks form space-time block coding.

2. A method according to claim 1, wherein each block to be transmitted first is multiplied by a pre-determined matrix before transmission.

3. A method according to claim 1, wherein space-time block coding is performed on the combined blocks.

4. A data transmission method between two transceivers, comprising:

a) using more than one antenna for receiving and transmitting a signal in at least one transceiver;

b) dividing in the first transceiver the symbols to be transmitted into blocks, the number of which is divisible by the number of transmitting antennas;

c) multiplying the blocks by coefficients describing a time-space block code to obtain at least two sets of blocks;

d) transmitting a first set of blocks using one antenna for each block;

5 e) receiving the blocks in the second transceiver using one or more antennas;

f) checking in the second transceiver whether the blocks were received successfully;

g) transmitting an acknowledgement to the first transceiver;

and, if the reception of blocks failed,

10 i) storing the blocks in memory in the second transceiver;

j) transmitting the next space-time block coded blocks from the first transceiver;

k) receiving the retransmitted blocks in the second transceiver using one or more antennas and performing space-time decoding on the retransmitted blocks and the blocks in memory; and if the blocks transmitted first were received successfully, moving to step b).

15 5. A data transmission system comprising a first and a second transceiver, and further comprising

means for dividing in the first transceiver the symbols to be transmitted into blocks, the number of which equals the number of transmitting antennas;

means for transmitting one block using each antenna in the first transceiver;

25 one or more antennas in the second transceiver for receiving the blocks;

means in the second transceiver for checking whether the blocks were received successfully;

means in the second transceiver for transmitting an acknowledgement to the first transceiver;

30 means in the second transceiver for storing the blocks in memory;

means in the first transceiver for selecting the format for the same blocks so that when the blocks transmitted first are combined with the retransmitted blocks, the coding of the combined blocks forms a space-time block code;

means in the first transceiver for retransmitting the same blocks;

35 means in the second transceiver for combining the blocks transmitted first with the retransmitted blocks.

6. A data transmission system according to claim 5, wherein the first transceiver comprises means for performing space-time block coding on the blocks to be transmitted.

5 7. A data transmission system according to claim 5, wherein the second transceiver comprises means for performing space-time block coding on the blocks received from retransmission and on the blocks retrieved from memory.

8. A data transmission system according to claim 5, wherein the first and the second transceiver are transceivers of a cellular radio system.

10 9. A data transmission system according to claim 5, wherein the data transmission system is an EDGE system.

10. A data transmission system according to claim 5, wherein the data transmission system is adapted to employ the TDMA as the multiple access method.

15 11. A data transmission system according to claim 5, wherein the data transmission system is adapted to employ the CDMA as the multiple access method.

20 12. A data transmission system according to claim 5, wherein the data transmission system is adapted to employ the OFDM as the multiple access method.